

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202311053179 A

(19) INDIA

(22) Date of filing of Application :08/08/2023

(43) Publication Date : 01/09/2023

(54) Title of the invention : A SYSTEM AND METHOD FOR SECURE WEATHER FORECASTING

(51) International classification :G06F0021620000, G01W0001100000, H04W0004020000, H04L0009320000, G01W0001000000
(86) International Application No :NA
Filing Date :NA
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

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(57) Abstract :

The present invention discloses a system (100) for secure weather forecasting that ensures user privacy and timely alerts for severe weather events. The system (100) comprises a server (106), a processor (102), and a memory (104) with instructions for execution. The processor (102) establishes a secure communication channel with one or more computing devices (110) and receives location data from one or more users (112) in a specific region. By introducing noise onto the received location data, the system (100) protects user privacy. Real-time weather data is collected and analyzed alongside the noise-introduced location data to generate accurate weather forecasts for the specific region. The generated weather forecasts are transmitted to the one or more users (112) through the one or more computing devices (110). Additionally, the system (100) detects severe weather events based on the generated forecasts and promptly generates alert signals, transmitting them to the one or more users (112) to warn them of the impending weather events. This innovative system combines secure communication, differential privacy, and real-time analysis to deliver precise weather forecasts while safeguarding user privacy and providing timely alerts for severe weather events

No. of Pages : 26 No. of Claims : 10